

REMARKS

The Applicants appreciate the Examiner's thorough examination of the subject application. Applicants request reconsideration of the subject application based on the following amendments and remarks.

Applicants have not amended the title of the invention because the title appears to clearly indicate the subject matter of the invention. The claims, as amended, provide active matrix substrates (claims 1-6 and 28); display devices (claims 7-13 and 29); image capturing devices (claims 15-21 and 30); and methods of making active matrix substrates (claims 22-27). Thus it appears that the present title, "Active Matrix Substrate, Method Of Manufacturing The Same, And Display And Image-Capturing Devices Utilizing The Same" clearly defines the subject matter of the invention. However, Applicants are open to the Examiner's suggestions of alternate language for the title.

Claims 1, 7, 10, 14, 17, and 22 have been amended. New claims 27-30 have been added. Support for the amendments may be found throughout the specification. No new matter has been added by the amendments to the specification or the claims. Support for claims 1, 7, 10, 14, 17, and 22 may be found at page 12, line 19 to page 13, line 24. Support for new claims 27-30 may be found in Figure 1 and page 17, lines 9-23.

Figures 6(a), 6(b), and 7 were objected to for not indicating that the figures only illustrate prior art material. Enclosed herewith are amended drawings sheets complying with the Examiner's request. Thus the objection should be withdrawn.

A brief description of the present invention may be of assistance in addressing the rejections set forth by the Examiner under §102 and §103.

The present invention provides an active matrix substrate, comprising:

electrode wires constituted by scanning electrode wiring and signal electrode wiring that are arranged in a lattice;

an insulating film provided at least on the electrode wires so as to have openings in predetermined areas at least either on the scanning electrode wiring or on the signal electrode wiring; and

a metal layer stacked on the electrode wiring in the openings.

In a illustrative embodiment which is presented in Figures 2(a) – 2(g), provides an active matrix substrate in which an insulating film (8) is provided on the electrode wires so as to have openings (11a and 11b), which are filled with a metal layer (12), in predetermined areas at least either on the scanning electrode wiring (2) or on the signal electrode wiring (6).

Moreover, the metal layer (12) is in contact with at least one of the electrode wirings of the active matrix substrate. In Figure 2(e) – 2(g), for example, the metal layer (12) is in contact with the signal electrode wiring (6).

Claims 1, 7, and 12 were rejected under 35 U.S.C. §102(b) as being anticipated by Shimada et al. (U.S. Patent 5,953,084). The rejection is traversed.

The Examiner, in formulating the §102(b) rejection as anticipated by Shimada, asserts that:

1. Components (36a) and (36b) are signal electrodes;
2. The insulating film (38) is provided on at least one of the electrode wires so as to have an opening (26a) in predetermined areas at least on either the scanning electrode (32) or on the signal electrode (36a) or (36b);
3. A metal layer (23b) is stacked on the electrode (32), (36a), or (36b) in the opening (26a).

Applicants respectfully submit that the assertions in each of points 1 through 3 above are incorrect.

As the reference is understood, the active matrix substrate taught by Shimada comprises a source electrode (36a) {column 8, line 2}, a **drain** electrode (36b) {column 21, lines 46-48}, and an opening (26a) in the insulating layer (38) **formed above** a metal electrode (23b) which is connected to the drain electrode (36b). Moreover, Shimada apparently teaches an opening (26a) in the insulating layer (38) which is filled with a pixel electrode (21) and part of another layer (45). Thus, Shimada neither discloses nor suggests a metal layer disposed in the opening of the insulating layer.

Thus, Shimada neither discloses nor suggests an active matrix substrate having a source electrode wiring or a signal electrode wiring having an insulating layer having at least one opening to the wiring formed thereon and a metal layer, which is stacked on the electrode wiring and disposed in the opening of the insulating layer.

Thus, Shimada fails to teach the structural elements of claims 1 or 7. Claim 12 depends from claim 7. Thus, Claims 1, 7, and 12 are patentable over Shimada.

Claims 1, 2, 5, 7, , 11, and 12 were rejected under 35 U.S.C. §102(b) as being anticipated by Wakai et al., (U.S. Patent 5,166,085).

Claims 3,4, 6,9, 10, 13-18, and 21-26 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wakai. The rejection is traversed.

For the sake of brevity, the two § 102 and § 103 rejections are addressed in combination. Such a combined response is considered appropriate because *inter alia* each of the rejections relies on the Wakai patent as the sole or primary citation. Each of the rejections is traversed.

The Examiner has alleged that Wakai teaches the active matrix substrate of the present invention. Moreover, the Examiner in formulating the rejection over Wakai asserts that:

1. electrode wires, constituted by scanning electrodes (102) and signal electrodes (106) and (107), are arranged in a lattice; and
2. an insulating film (108) is provided on at least one of the electrode wires so as to have an opening (109) in predetermined areas at least on either the scanning electrode (106) or on the signal electrode (106) or (107).

Applicants respectfully submit that both assertions 1 and 2 are not correct.

As the reference is understood, Wakai teaches a lattice of drain electrode (114) and a gate electrode (113). See Figure 6 and column 6, lines 35-55. Thus, Wakai neither discloses nor suggests the lattice of scanning electrode wiring and signal electrode wiring provided by the instant invention.

Additionally, Wakai teaches a opening (109) in the insulating opening (108) which opens to electrode (107). Applicants note that electrode (107) is not one of the electrodes forming the lattice of the substrate in Wakai. More particularly, Wakai neither discloses nor suggests an insulating film provided at least on the electrode wires so as to have openings in predetermined areas at least either on the scanning electrode wiring or on the signal electrode wiring. Compare Figure 6 of Wakai (in which the opening (109) in the insulating layer is not aligned with the electrodes forming the lattice, e.g., the gate electrode (113) and the drain electrode (114)) with Figure 1 of the present invention (openings (11a) in the insulating layer opens onto the signal electrode wiring (6)).

The Examiner further alleges that a number of features provided by claims 3, 4, 6, 9, 10, 13-18, and 21-26 are known techniques, components or applications which would have been obvious to one skilled in art. Applicants respectfully disagree. Moreover, none of the assertions set forth by the Examiner regarding claims 3, 4, 6, 9, 10, 13-18, and 21-26 would be sufficient, if true, to overcome the structural differences between Wakai and the present invention. Thus, the subject matter of claims 3, 4, 6, 9, 10, 13-18, and 21-26 would not have been obvious to one skilled in the art based on the disclosure of Wakai.

Claims 1 and 7 are patentable over Wakai. Claims 2, 5, 8, 11, and 12 depend from claims 1 and 7, and are therefore also patentable over Wakai. Claims 14 and 22 would not have been obvious to one skilled in the art based on the disclosure of Wakai. Claims 3, 4, 6, 9, 10, 13-18, and 21-26 depend from claims 1, 7, 14 and 22, and therefore would not have been obvious to one skilled in the art based on the disclosure of Wakai.

Although it is not believed that any additional fees are needed to consider this submission, the Examiner is hereby authorized to charge our deposit account no. 04-1105 should any fee be deemed necessary.

Respectfully submitted,



Date: October 28, 2002

John B. Alexander (Reg. No. 48,399)
EDWARDS & ANGELL, LLP
Dike, Bronstein, Roberts & Cushman
Intellectual Property Practice Group
P. O. Box 9169
Boston, MA 02209
Tel: (617) 439-4444
Fax: (617) 439-4170 / 7748

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

1. (amended) An active matrix substrate, comprising:
electrode wires constituted by scanning electrode[s] wiring and signal electrode[s] wiring
that are arranged in a lattice;
an insulating film provided at least on the electrode wires so as to have openings in
predetermined areas at least either on the scanning electrode[s] wiring or on the signal
electrode[s] wiring; and
a metal layer stacked on the electrode[s] wiring in the openings.
7. (amended) A display device, comprising:
an active matrix substrate; and
an electro-optical medium driven by the active matrix substrate,
the active matrix substrate including: electrode wires constituted by scanning electrode[s]
wiring and signal electrode[s] wiring that are arranged in a lattice; an insulating film provided at
least on the electrode wires so as to have openings in predetermined areas at least either on the
scanning electrode[s] wiring or on the signal electrode[s] wiring; and a metal layer stacked on
the electrode[s] wiring in the openings.
- 10 (amended) The display device as defined in claim 7, wherein
at least either the scanning electrode[s] wiring or the signal electrode[s] wiring are
fabricated from a transparent conducting oxide film.
14. (amended) an image-capturing device, comprising:
an active matrix substrate; and
a photoconductor of which electric charge is read by the active matrix substrate
the active matrix substrate including: electrode wires constituted by scanning electrode[s]
wiring and signal electrode[s] wiring that are arranged in a lattice; an insulating film provided at

least on the electrode wires so as to have openings in predetermined areas at least either on the scanning electrode[s] wiring or on the signal electrode[s] wiring; and a metal layer stacked on the electrode[s] wiring in the openings.

17 (amended) The image-capturing device as defined in claim 14, wherein at least either the scanning electrode[s] wiring or the signal electrode[s] wiring are fabricated from a transparent conducting oxide film.

22. (amended) A method of manufacturing an active matrix substrate, comprising the steps of :

(a) forming scanning electrode[s] wiring and signal electrode[s] wiring, for acting as electrode wires, arranged in a lattice on a substrate;

(b) forming an insulating film at least on the electrode wires so as to have openings in predetermined areas at least either on the scanning electrode[s] wiring or on the signal electrode[s] wiring; and

(c) forming a metal layer selectively in the openings on the electrode[s] wiring.

Kindly add new claims 27-30, as follows:

27. (new) The method of manufacturing an active matrix substrate as defined in claim 22, wherein:

the opening and the metal layer are provided along the length of at least either one of the scanning electrode wiring and the signal electrode wiring.

28. (new) The active matrix substrate as defined in claim 1, wherein

the opening and the metal layer are provided along the length of at least either one of the scanning electrode wiring and the signal electrode wiring.

29. (new) The display device as defined in claim 7, wherein

the opening and the metal layer are provided along the length of at least either one of the scanning electrode wiring and the signal electrode wiring.

30. (new) The image-capturing device as defined in claim 14, wherein the opening and the metal layer are provided along the length of at least either one of the scanning electrode wiring and the signal electrode wiring.